

THE USE OF COLLAPSING PRESSURE TO DETERMINE THE DIAMETER OF HOLLOW-FINE-FIBRE CELLULOSE ACETATE MEMBRANES BY DRY-WET SPINNING TECHNIQUE

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Hollow-fine-fibre membranes (HFF) have inherent advantages over spiral-wrap membranes, including a favourable membrane surface area per total separator volume and the ability to withstand high operating pressures due to their small dimensions. This study focuses on two aspects of hollow-fine-fibres. First, the optimal range of fibre dimensions was determined by means of a collapsing pressure calculation using the elastic buckling pressure (EBP) equation (thin shell assumption). Second, pressure drop (ΔP) across the fibre bore in the hollow-fine-fibre was determined by using the Hagen-Poiseuille equation in order to determine how this would affect the chosen fibre dimension. These results are to be validated by the experimental tests of hollow-fine-fibre cellulose acetate membranes (CA) produced by a dry-wet spinning technique.

Keywords: Hollow-fine-fibre, Pressure drop, Elastic Buckling Pressure, Cellulose Acetate